

Field Sampling Plan for Group 3, PM-2A Tank V-14 Treated Contents for Test Area North, Waste Area Group 1, Operable Unit 1-10

July 2005

**Idaho
Cleanup
Project**

The Idaho Cleanup Project is operated for the
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Revision 2
Project No. 23095

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PM-2A Tank V-14 Treated Contents for
Test Area North, Waste Area Group 1,
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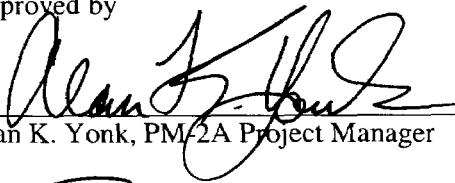
Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE-NE Idaho Operations Office
Contract DE-AC07-05ID14516

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PM-2A Tank V-14 Treated Contents for
Test Area North, Waste Area Group 1,
Operable Unit 1-10**

ICP/EXT-05-00827

Approved by



Alan K. Yonk, PM-2A Project Manager

08/02/05

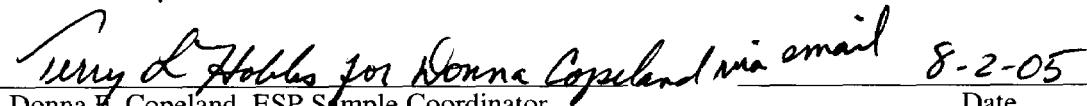
Date



David L. Eaton, WAG 1 Environmental Lead

8/2/05

Date



Donna F. Copeland, ESP Sample Coordinator

8-2-05

Date

REVISION RECORD

Rev.	Date	Description	Comments
0	May 2005	Original issue.	
1	July 2005	Minor change to document to address a preliminary sampling event prior to waste treatment.	Change provides for a preliminary sampling event (prior to waste treatment) that will be used as an exercise to identify any impediments that might arise as part of the main sampling event taking place after waste treatment. Identification of impediments will allow necessary measures to be developed to prevent or mitigate those negative consequences thereby facilitating a timely and efficient implementation of the main sampling event after treatment.
2	July 2005	Minor change to include revised JSA	JSA modified to include review and signature by ICDF Stoller Safety Officer

ABSTRACT

This document was prepared in accordance with Template (TEM)-104, “Model for Preparation of Characterization Plans” and Idaho Completion Project Management Control Procedure-9439, “Environmental Sampling Activities at the INEEL.” This document meets the intent of a “characterization plan,” as defined in TEM-104.

For PM-2A V-14 tank sampling activities, Environmental Services Project (ESP) sampling work is covered under an MCP-3562, “Hazard Identification, Analysis and Control of Operational Activities” hazards checklist and job safety analysis (JSA), both attached to this plan. A review of the facility health and safety plan (HASP) INEEL/EXT-01-01318 will also be required. ESP will perform the work covered under this plan, so all health and safety aspects related to the sampling activity are covered herein.

For this project, there will be two work control documents: (1) this plan, which includes a hazards checklist and JSA and (2) the project Health and Safety Plan provided by the facility.

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ACRONYMS

CERCLA	Comprehensive Environmental response, Compensation, and Liability Act
COC	chain of custody
DAR	Document Action Request
DOE	U.S. Department of Energy
DQO	data quality objective
EDF	engineering design file
EPA	U.S. Environmental Protection Agency
ESH&OA	environmental, safety, health, and quality assurance
ESP	Environmental Services Project
HASP	health and Safety plan
ICDF	Idaho CERCLA Disposal Facility
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
JSA	job safety analysis
LDR	land disposal restrictions
MCP	management control procedure
OSHA	Occupational Safety and Health Administrative
PCE	tetrachloroethylene
PLN	plan
PM	project manager
PPE	personal protective equipment
QAPJP	Quality Assurance Project Plan
RAL	Remote Analysis Laboratory

RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
SAM	Sample and Analysis Management
SOW	statement of work
TAN	Test Area North
TEM	template
TOS	task orders statement
TSF	Technical Support Facility
VOC	volatile organic compound
WAC	Waste Acceptance Criteria
WGS	Waste Generator Services
WTS	waste technical specialist

Field Sampling Plan for Group 3, PM-2A Tank V-14 Treated Contents for Test Area North, Waste Area Group 1, Operable Unit 1-10

1. INTRODUCTION

This sampling plan was prepared in response to Service Authorization Form No. 3469 initiated for Al Yonk for the Test Area North (TAN) Technical Support Facility (TSF)-26 PM-2A tank (V-14). Tank V-14 was installed in the mid-1950s to store radioactive liquid waste concentrated by the TAN-616 and PM-2A evaporators. In 1975, it was removed from service. From 1972 (when the TAN-616 evaporator was removed from service) until 1975, Tank V-14 received the raw liquid waste directly from Tanks V-1 and V-3. To the extent practical, water was removed from the tank in the early 1980s. Approximately 10,000 lb of diatomaceous earth was deposited into the tank to absorb the remaining liquid. Historical information on the evaporators is provided in the *Data Quality Objectives Summary Report for the PM-2A Tanks (TSF-26)* (Reese and Rodriguez 2000) and the *Final Report—Decontamination and Decommissioning of TAN Radioactive Liquid Waste Evaporator System (PM-2A)* (Smith 1980).

This plan identifies the activities for the test run and post-treatment sampling project and establishes the procedures and requirements that will be used to perform field sampling and analysis. The health and safety requirements to perform sampling for both activities will be covered via a briefing on the Idaho Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Disposal Facility (ICDF) health and safety plan (HASP) and the job safety analysis (JSA) attached to this plan. This plan was prepared in accordance with the requirements outlined in Idaho Completion Project (ICP) Management Control Procedure (MCP)-9439, “Environmental Sampling Activities at the INEEL” and Template (TEM)-104, “Model for Preparation of Characterization Plans.” It contains information about the characterization activity, analytical and quality assurance/quality control (QA/QC) requirements, hazards involved in performing the task(s), and the specific actions and equipment that will be used to protect persons working at the task site.

1.1 Project Objectives

This activity’s objectives are to provide confirmation that the V-14 contents meet the required treatment standards for the hazardous contaminants identified by the project and confirmation prior to treatment that the proposed approach will be successful. Activities will be coordinated between TAN, Environmental Services Project (ESP) and ICDF Complex personnel. The project requested a multiphase approach consisting of:

1. Pre-treatment test run sampling to work out all logistics associated with coordination between organizations and companies, access to the tank, successiveness of tools and retrieval of material, coordination with packaging and transportation and expedited receipt of data from the onsite laboratory.
2. Wet sparging at ICDF.
3. Off-gas monitoring at ICDF.
4. Sampling of V-14 by ESP, possibly multiple times, depending on analytical results.

After successful treatment, confirmation sampling, and the addition of absorbent to eliminate free liquids, paint filter liquid test (PFLT) core samples may be required. PFLTs are only necessary if absence of free liquids cannot be visually confirmed.

This document is implemented in accordance with the *Quality Assurance Project Plan (QAPjP) for Waste area Groups 1,2,3,4,5,6,7,10 and Deactivation, Decontamination, and Decommissioning* (DOE/ID-10587), which governs ESP work for characterization sampling performed by Idaho National Laboratory (INL) employees, subcontractors, and employees of other companies or U.S. Department of Energy (DOE) laboratories.

1.2 Site Description

The INL encompasses 2,005 km² (890 mi²) and is located approximately 55 km (34 mi) west of Idaho Falls, Idaho (see Figure 1). In 1949, the United States Atomic Energy Commission (now the DOE) established the Nuclear Reactor Testing Station (now INL) as a site for building and testing nuclear facilities. At present, INL supports the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management and technology development, and energy technology and conservation programs.

The site description of the INL is provided in the QAPJP referenced in Section 1.1. The description of TAN is also provided in the referenced QAPJP. V-14 has been removed from TAN-607 and shipped to the ICDF for treatment, post treatment characterization and disposal. The tank is located in a specially constructed secondary containment area.

ICDF is located immediately southwest of the Idaho Nuclear Technology and Engineering Center (INTEC), Waste Area Group (WAG) 3 (see Figure 2). The INTEC houses reprocessing facilities for government defense and research spent fuels. Facilities at INTEC include spent fuel storage and reprocessing areas, a waste solidification facility and related waste storage bins and remote analytical laboratories. The project has requested that samples be analyzed at the INTEC Remote Analytical Laboratory (RAL).

CERCLA wastes generated within the boundaries of INL are disposed of at the ICDF. ICDF is an on-Site, engineered facility designed and authorized to accept not only WAG 3 wastes, but also wastes from other INL CERCLA actions, providing this waste meets land disposal restrictions (LDR) requirements.

The pre-treatment test run will be performed to ensure all logistics have been adequately addressed and accounted for prior to treatment. Contaminant concentrations for everything other than PCE should be comparable to post-treatment samples. The PCE in the pre-treatment sample should be in the range of 50-200 ppm, while the post-treatment sample should be less than 1 ppm PCE. The post-treatment material is also expected to reflect a more even distribution over multiple samples. The results of post-treatment sampling will be used to complete an Integrated Waste Tracking System (IWTS) material profile for the treated waste and tank. The WAG 1 generator is responsible for characterizing waste destined for ICDF disposal in accordance with ICDF criteria. A copy of this sampling plan was provided to the BBWI/ICDF liaison and Waste Generator Services (WGS) waste technical specialist (WTS) to ensure that resulting data are adequate and compliant with ICDF Waste Acceptance Criteria (WAC).

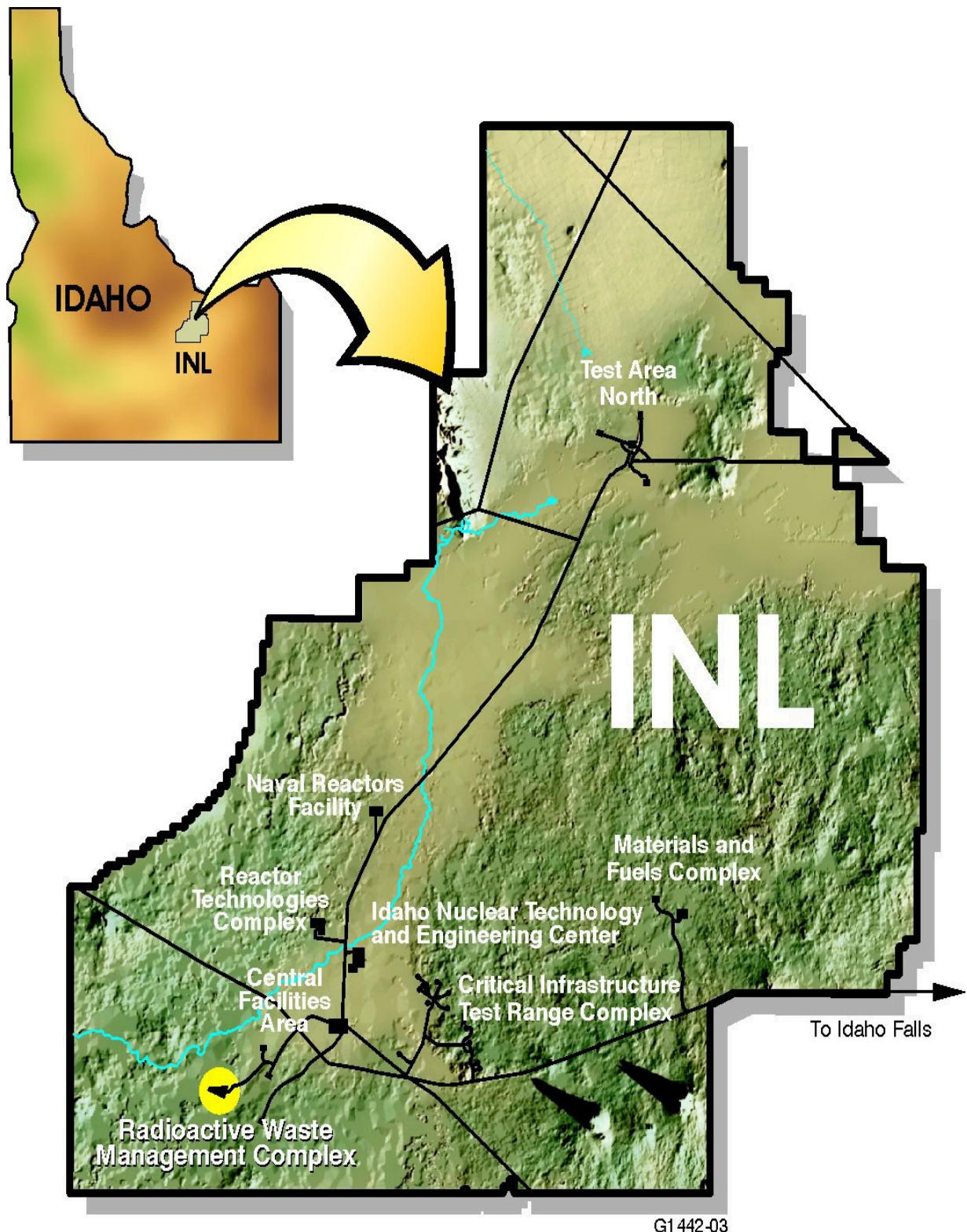


Figure 1. Map of the Idaho National Laboratory showing the location of major facilities.

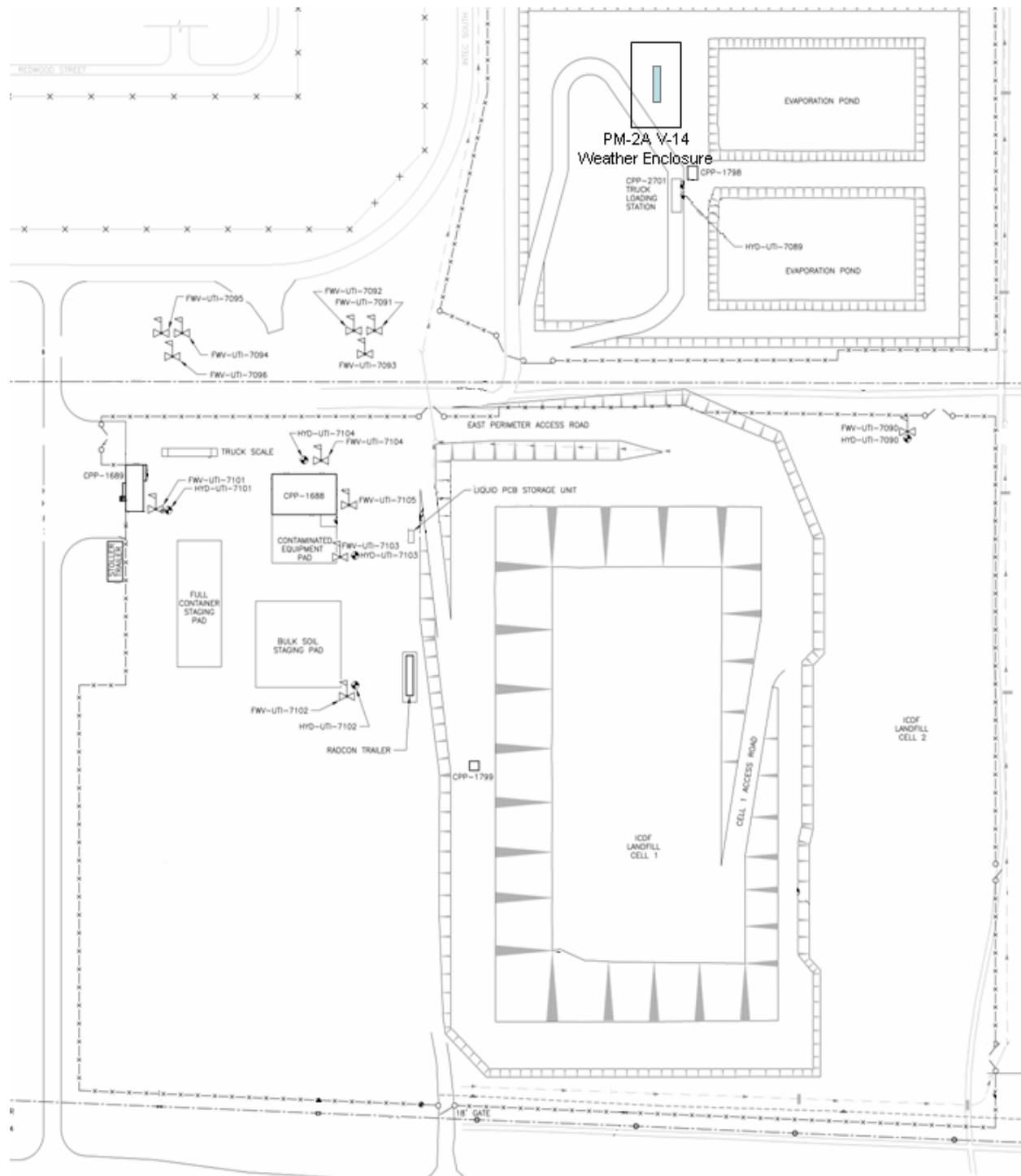


Figure 2. ICDF layout.

The material of concern resides in existing V-14 currently stored at ICDF. The tank has a 50,000-gal capacity, is constructed of carbon steel, and measures 12.5 ft in diameter and 55 ft in length. Multiple previous sampling activities have occurred and in 2004, V-14 tank was determined to be noncompliant with LDRs for tetrachloroethylene (PCE); see Engineering Design File (EDF)-4830, "Waste Generator Services Closure Report for the Contents of the PM-2A Tanks (TSF-26)." The concentration of PCE in V-14 was determined to be in excess of the applicable F001 LDR treatment standard. This requires that the concentration of PCE be reduced to less than 6 mg/kg prior to disposal of the waste.

V-14 tank contents will be treated via wet sparging techniques. It is expected that 1,000–2,000 gallons of water will be used to increase the mobility of the existing sludge/solids. Off-gas monitoring will be performed to indicate when sparging is no longer removing PCE; this activity will be covered in the facility operating procedure. At this point, samples will be collected from the treated waste to ensure that the PCE levels meet the LDR and WAC requirements. Mockup studies were performed to help determine the sampling approach. The study was performed by TAN project personnel using a combination of quartz sand and diatomaceous earth in a 12,000-gal tank. Mockup activities revealed that as one area of the tank was sparged, sand bars or gravel bars (consisting of diatomaceous earth) built up in other areas. That is, sparging did not uniformly suspend all of the material in the tank. As a result of the uneven distribution of the waste material in the mockup tank, project personnel have increased the number of sample locations for this sampling activity, and have confirmed that separate sampling of the liquid and solid phases will be necessary. In addition, a test run, as previously discussed, will be performed prior to treatment. Solids in V-14 tank are expected to be of similar approximate density and are expected to settle out quickly. The resulting waste stream is expected to include a foot or more of settled solids underlying approximately a foot of liquid.

Sparging will be performed through 10 sparge lance/nozzles in five regions within the tank. To adequately represent the post-spARGE material, the project has elected to collect two sample sets from each of three locations, which spatially and vertically reflect the conditions at given points within the tank. Separate samples will be collected at each point for both the liquid and solid phase. A duplicate (split) will be collected from one of the six locations for an overall number of seven sample sets per phase. In order to address questions related to buildup near the ribs, the sample location that would have been nearest one of the ribs will be shifted slightly so as to be adjacent to that rib. Additional detail regarding the sampling approach/rationale is provided in Section 4. Test run sampling will be limited to one location as determined by project personnel.

2. PROJECT ORGANIZATION AND RESPONSIBILITIES

ICP-MCP-9439 and the applicable QAPjP provide the description of the resources and resource responsibilities associated with environmental sampling activities. Table 1 contains specific personnel assignments and contact information not identified in DOE/ID-10587.

Table 1. Proposed personnel and job assignments.^a

Assignment	Name	Phone
Environmental, Safety and Health (ES&H) and Quality Assurance (QA)	Quality - John Farren ^a Safety – Darrin Dobbins ^a	526-1084 526-1051
	Jonathan Roberts provided Safety review	
	Environmental – Dave Eaton ^a	526-7002
	Mahlon Heileson	526-2954
	Radiological – John Horton, Lyle Mckinlay ^a	526-0514 526-2710
	Quality – Randall Allen ^a	526-4454
Project Manager/Requestor	Al Yonk ^a	526-5828
ICDF Project Manager	Gerry Streier ^a	526-7550
Waste Generator Services (WGS) Facility Representative for ICDF and TAN/Waste Technical Specialist (WTS) for ICDF	Randy Romine ^a John Harris ^a Jim Curnutt ^a	526-9690 526-3461 526-4428
Sample and Analysis Management (SAM) Technical Representative	Darwin Grigg	526-9741
Environmental Services Project (ESP) Sampling Coordinator	Donna Copeland	526-7050
Data Storage Administrator and Closure Report Generator	Donna Kirchner	526-9873
Other reviewers ^b	Patrick Gibson Al Jantz Roy Simonds	526-1379 526-8517 526-0273

a. Required to approve this plan based on designation as part of the hazard evaluation group (HEG) required by MCP-3562.

b. Identified as additional reviewers only as directed/forwarded by the project

2.1 Environmental, Safety, Health, and Quality Assurance Support

Environmental, safety, health, and quality assurance (ESH&QA) personnel are assigned to the job site to provide resources and expertise to resolve ESH&QA issues. Personnel assigned to provide ESH&QA support must be qualified to recognize and evaluate hazards, environmental concerns, or quality issues according to his or her expertise and will be given the authority to take or direct immediate actions to ensure compliance and protection. ESH&QA personnel assess and ensure compliance with applicable INL procedures, including this document.

2.2 Project Manager/Requester and ICDF Facility Manager

The project manager (PM), work requester, and ICDF facility manager will ensure that all activities conducted during the project comply with INL management control procedures and program requirements documents, and all applicable requirements of the Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), DOE, U.S. Department of Transportation, and the State of Idaho. The PM coordinates all document preparation, field and laboratory activities, data evaluation, risk assessment, dose assessment, and design activities. The PM is responsible for the overall work scope, schedule, and budget.

The PM is responsible for field activities and for all personnel (including craft personnel) assigned to work at the project location. The PM will serve as the interface between operations and project personnel and will work closely with the sampling team at the site to ensure that the objectives of the project are accomplished in a safe and efficient manner. The PM will work with all other identified project personnel to accomplish day-to-day operations, identify and obtain additional resources needed at the site, and interact with ESH&QA oversight personnel on matters regarding health and safety.

The ICDF facility manager will ensure that all work is performed in compliance with facility-specific requirements and that workers are aware of any health and safety hazards that may affect the job.

2.3 Waste Generator Services Facility Representative/Waste Technical Specialist

The INL WGS facility representative will ensure disposition of waste material complies with approved INL waste management procedures. WGS personnel have the responsibility to help solve waste management issues at the task site. WGS personnel also prepare the appropriate documentation for waste disposal and make the proper notifications, as required. All wastes will be disposed of using approved INL procedures in accordance with INL MCP-3472, “Identification and Characterization of Environmentally Regulated Waste.”

2.4 Sample and Analysis Management Technical Representative

The Sample and Analysis Management (SAM) technical representative is responsible to help define the analytical project, generate the sampling and analysis plan table, and generate and issue sample labels. The SAM representative will determine which laboratory will provide analytical services based on established policies and contracts, and will prepare the task order statement(s) (TOS). The SAM representative will also track analytical progress and perform cursory review of the final data packages. The SAM representative will obtain independent validation of the data results as project requirements dictate.

2.5 Environmental Services Project Sampling Coordinator

The ESP sampling coordinator is responsible for coordinating sampling activities applicable to this project. Upon notification by the project manager, the sampling coordinator is responsible for obtaining and scheduling the necessary resources to complete the sampling task. The sampling coordinator will schedule sampling personnel to complete the task. The sampling coordinator is also responsible for managing and obtaining sampling supplies and tools to complete the task, if needed.

2.6 Sampling Team Lead/Plan Author

An ESP representative will be the sampling team lead for the sampling task and will ensure ESP is given a pre-job briefing and will oversee sampling documentation and performance of the associated sampling activities. ESP/sampling team lead activities usually include reviewing the request for sampling, walking down the job site, issuing a sampling plan, notifying the SAM to procure laboratories, ensuring that all required reviews and approvals are obtained on the sampling plan, coordinating purchasing the equipment necessary to perform the job, and ensuing the pre-job briefing is given. ESP will maintain a project file until the project is complete, and then turn it over to the data storage administrator.

2.7 Data Storage Administrator and Closure Report Generator

The data are tracked through the SAM. When data are received at the SAM, they are sent to ESP for interpretation and issuance of a closure report to the project requester. The data storage administrator is responsible for maintenance of data records. The final project file will be scanned into the Electronic Document Management System.

3. DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) are qualitative and quantitative statements derived from the first six steps of the EPA DQO process and are summarized in the applicable project QAPjP referenced in Section 1.1.

3.1 Problem Statement

The problem statement is: there is a need to perform post-treatment confirmation that V-14 contents meet LDR treatment standard for **PCE only**. Previous sampling of V-14 indicated that contents were LDR compliant for all contaminants of concern with the exception of PCE; other constituents in the tank contents were in compliance with the ICDF WAC. The treatment process selected for treatment of the contents will not result in changes to the LDR status of the tank contents except for PCE, which will be LDR compliant after treatment. Other constituent concentrations in the tank contents will be lower than indicated in previous sampling due to the addition of the water and absorbent used during the process to treat the PCE. Material will be treated until the waste is compliant with LDRs. To meet project needs, percent moisture/water content must also be performed on the solids phase. The planning team and available resources are identified in Section 2. The decision-maker for the activity is the TAN project manager, Al Yonk. The field sampling activity is to be completed in 2005. Analytical data validated to Level A is required prior to August 19, 2005, to allow time for crane/transporter mobilization and tank relocation to the landfill before the end of September per DOE NE-ID commitment to the Idaho Department of Environmental Quality and EPA.

Test run activities are not considered part of the formal DQOs and will not be addressed further in the following DQO discussion; the test run is to ensure that the project is adequately prepared for the formal sampling activities. The request for a test run was added after Agency approval of this document. The project manager confirmed that no additional Agency review is required. Specifics regarding the test run are provided in Section 4. It is expected that the test run will be performed approximately one month prior to the formal sampling activities.

3.2 Decision Statement

Confirmation waste sampling must be performed to determine that wet-sparging treatment is successful and LDR treatment standards are met. Based upon existing data from previous sampling efforts, the simplicity of the treatment method, and the increased mass due to addition of water and solidification agent as part of the treatment process, the project manager has determined that PCE is the only constituent that requires further information because PCE is the only constituent that requires treatment based on the record of decision. If PCE is present at levels greater than the LDR limit of 6 ppm, additional sparging will be required, followed by more sampling until the PCE levels are acceptable to the project. ICDF representatives will review this rationale and approach to ensure that all organizations agree that the planned strategy will meet project DQOs and WAC for disposal at ICDF. Note that a PFLT will be required on a core of material after treatment AND absorption if absence of liquids cannot be visually confirmed. Additionally, the project has requested percent moisture/water content analyses on each solid sample. Percent moisture/water will be used in the calculation of the final PCE concentration for the entire waste stream as explained in Section 4.1.7.

The objective of post-treatment sampling of V-14 will be to answer the following question:

- What is the post-treatment concentration of PCE in a representative sample of the liquid and solid waste?
- What is the percent moisture/water content concentration in a representative sample of the solid waste?

The objective of post-treatment and absorption sampling of V-14 will be to answer the following question:

- Are free liquids present in the waste?

The alternative actions to be taken, depending on resolution of the principal study question(s), are as follows:

- Based on initial post-treatment sampling, V-14 waste will require additional treatment prior to disposal, or treatment will have been successful and the project may begin disposal actions at ICDF.
- Based on initial post-treatment sampling and absorption sampling, the V-14 waste will require additional absorption prior to landfill disposal.

Combining the principal study question and alternative actions results in the following decision statement:

- Using post-treatment data, determine the need for additional treatment/absorption or verify that waste is ready for ICDF disposal.

3.3 Decision Inputs

To resolve the decision statement, data—determined using analyses conducted in accordance with Resource Conservation and Recovery Act (RCRA) analyses—must be collected. Previous data exist and the project has determined that material in V-14 is not LDR compliant without treatment. One round of wet-sparging treatment is expected to reduce levels of PCE adequately to comply with the LDR of 6 ppm. However, if laboratory data indicate that the levels of PCE are not acceptable, additional treatment and sampling will occur until acceptable levels are achieved. For each post-treatment activity, multiple samples will be collected to measure data comparability.

3.4 Study Boundaries

It is expected that points/holes cut for previous sampling will be used for post-treatment sampling activities. If the existing locations are unavailable for sampling, then new access points will be required to accommodate sampling of the post-treatment waste. Positioning of the sample ports with regard to proximity to the air input areas is not a concern, as sparging activities will cease during sampling. A systematic random approach was initially used for placement of the sample holes and will be applied again; refer to INEEL/EXT-03-00304, Field Sampling Plan for the TSF-26, PM-2A Tank Contents at Waste Area Group 1, Operable Unit 1-10. Vertical and horizontal representation of material from top to bottom and end to end of the tank – as demonstrated by the existing sample points – is needed in order to establish whether treatment was successful throughout the tank. After sparging, the liquid phase is expected to be homogeneously mixed at all locations (in addition, liquid has little capacity to hold PCE); so, pulling liquid directly from the surface into sample containers – without reflecting the entire column of liquid – is acceptable to the project. A minimum of three distinct sample access points will be available. The solids tool will be maneuvered so that material reflects two side angles per hole; a duplicate (split) sample will be collected from one of the locations for a total of seven sample sets. In order to address questions related to buildup of solids near the ribs, the sample location that would have been nearest one of the ribs will be shifted slightly, as directed by project personnel, so as to be adjacent to that rib. Liquid samples will be collected first – again, two samples per hole, with a duplicate/split on one location – but there is no need to reflect angles or overall depth as liquid material is not expected to vary spatially or vertically.

As discussed in Section 4, the sample collection option that provides the most representative characterization of the sample population for the conditions present while adequately protecting the health and safety of the sampling team members will be chosen. Limitations on data interpretation introduced by sample collection constraints, if applicable, will be discussed in the project final report. There is no reason to suspect that representative samples cannot be collected due to the expected consistency of the media post-treatment. Liquids will be assumed to be homogeneously mixed at the sample location and integration over depth is not critical. The solids sample will be required to be roughly representative from the top of any solids layer to the bottom of the tank shell. An overall mass balance of solids to water will be based upon historical knowledge of waste in the tank, taking into consideration water added and water lost through evaporation. Accessibility to the top of the tank and how elevated work will be performed is still being determined. The project has confirmed that access will be made available and the JSA reflects that elevated work will apply.

Based on the simulated waste mockup activities, sand/gravel/silts in solution are expected to settle out quickly into a distinct layer underlying the liquid phase. The field team will collect the liquid phase and then the solid phase from each of the designated locations.

3.5 Decision Rule

- If the PCE concentration exceeds the LDR F001 standard, the waste will require additional treatment and confirmation sampling prior to disposal.
- If visual inspection is unable to confirm no free liquid, then the PFLT will be performed. If the PFLT indicates free liquid, then additional absorbent will be added and additional PFLT sampling will be required. This step will occur irrespective of the percent moisture/water content results.

A 90% upper confidence limit (UCL), discussed in Section 3.6, “Decision Error Limits,” will be used to confirm compliance with Land Disposal Restrictions and the ICDF waste acceptance criteria for RCRA constituents.

3.6 Decision Error Limits

The two types of decision errors for waste material characterization are determining that the waste **does not** display contaminants (PCE) above the LDR F001 standard or free liquids, when, in fact, it **does**, or determining that the waste materials **do** display restricted levels of contaminants above the LDR F001 standard or free liquids, when in fact they **do not**. The consequences of each decision error must be considered.

Determining that the V-14 waste stream meets the treatment standard, when in fact, the waste fails to meet the treatment standard, would result in the V-14 waste not receiving appropriate treatment. This may result in CERCLA compliance issues and failure to protect human health and the environment. This type of wrong decision is generally referred to as a Type 1 error or a false positive error.

Determining that the V-14 waste does not meet the treatment standard, when in fact, the waste meets the treatment standard, would result in further expense of project resources to complete unnecessary activities (i.e., further treatment). This type of wrong decision is generally referred to as a Type II error or a false negative error.

The Field Sampling Plan recommends a minimum confidence level of 90% for Type I errors (false-positive), and the minimum complement of the power is 80% for the Type II errors (false negative). The 90% level was established based upon EPA guidance in SW-846 for determining compliance with concentration-based requirements.

3.7 Design Optimization

Based on the expected settling of solids out of solution, previous simulated waste mockup activities and accessibility of material, remote sampling will be performed. For liquids, ESP will use a bailer-type sampler as the best means of retrieval of surface liquids only, transferred from the bailer directly into sample containers, with as little additional disturbance as possible. For solids, ESP will use the Dobbins' tools (or equivalent) that were fabricated and that have been tested to successfully demonstrate retrieval (~90%) of material thought to be of similar consistency during mockup activities. The project has specifically requested that sample sets be taken at two discrete angles (spatially separated as far as possible – over an extent of several feet) for each of the three solids access points. These approaches will provide the best average overall in each sample container. Refer to Section 4.1.7, “Sample Collection Procedures,” of this plan. A 90% UCL is required for RCRA characterization.

4. SAMPLE COLLECTION, ANALYSIS, AND DATA MANAGEMENT

4.1 Sample Collection

4.1.1 Pre-Sampling Meeting

Before the start of each field-sampling project, ESP-assigned sampling resources prepare for the sampling activity in accordance with MCP-9228, “Environmental Sample Management,” and participate in applicable pre-job briefings conducted in accordance with MCP-3003, “Performing Pre-Job Briefings and Documenting Feedback.” Personnel at the meeting will ensure that all necessary equipment and documentation are present and that all personnel understand the project scope and objectives.

4.1.2 Sampling and Analysis Requirements

Table 2 summarizes the location to be sampled and the analysis to be performed for the test run and formal sampling activities. For the pre-treatment test run logistics event, one sample for PCE on the liquid and solid phases is requested, in addition to a percent moisture on the solid. No duplicate or any other QC is necessary for the test run. For each post-treatment event, a minimum of seven sample sets (six regular and one duplicate [split] for each phase) will be collected for PCE data comparability. An analysis for percent moisture/water content on each of the seven solids locations will also be required. Six cores (no duplicates required) are required if post-absorbent sampling for a PFLT core is required. PFLT sampling is only required if absence of free liquids cannot be determined visually. A copy of this Field Sampling Plan was provided to the SAM representative who will coordinate the laboratory(ies) and prepare the sample numbers table (Appendix A) and associated labels. The project has requested that the INTEC RAL perform the analytical work.

Using source term data from previous sampling and the actual field measurements on samples, adequate information should exist for making a packaging and shipping determination. Most likely, the samples will only have to be transferred inside the INTEC fence, but ESP will work with ICDF Traffic and Radiological Control personnel to determine requirements for doing so. Generally, the WTS prepares a source term and helps with the transport paperwork/logistics.

NOTE: *The INL SAM Program is responsible for obtaining laboratory analytical services for the required analyses in accordance with ICP MCP-9439, “Environmental Sampling Activities at the INEEL.” The SAM Program will prepare a TOS document for laboratory services.*

Maximum sample holding times are listed in Table 2 and are defined from the date of sample collection to the date of sample preparation or analysis. Samplers will coordinate with the analytical laboratory to ensure that samples arrive at the laboratory in order to meet holding times. Applicable preservation requirements for this sampling activity are identified in Table 2.

The project manager is responsible for ensuring that a Document Action Request (DAR) (Form 412.11) is written and approved for any increase to the scope or change in hazards documented in this plan or the corresponding health and safety work control before sampling. Sampling logbooks will be maintained in accordance with MCP-9227, “Environmental Services Project Log keeping Practices.”

4.1.3 Sampling Equipment and Documentation

Sampling equipment, documentation, and any other supplies that will be used for sampling are identified in MCP-9227, “Environmental Services Project Logkeeping Practices,” and MCP-9228, “Environmental Sample Management.” The following specific items, or appropriate substitutes, are required for this sampling activity:

- Dobbins’ tools and all assorted attachments/Auger/coring device, piston or column sampler, and extensions – solids
- Lexan tube liners and caps, if applicable – solids
- funnels/Teflon or stainless-steel bailer type sampler and secondary containment, as needed, for each location – liquid
- Personal protective equipment (PPE) designated in the JSA
- Monitoring equipment provided by project safety personnel, if required—radiological, airborne
- Chain of Custody (COC) forms
- Lead shielding provided by facility, if required
- Sample logbook—maintained by ESP
- Health and Safety Plan (HASP) provided by the facility
- Wipes/absorbent towels
- Bottles/labels
- Laboratory contracts
- Address labels
- Final plan
- Adhesive tape (clear, duct, and strapping)
- Liner bags, individual sample bags, and waste bags
- Aluminum foil
- Pens and markers
- Custody seals
- Packaging and all required components and paperwork—coordinated by project manager through ICDF Packaging and Transportation
- Cooler
- Freezer packs or bagged ice.

Table 2. Summary of sampling collection for test run and post-treatment mixture.

Location	Analysis Type/Code	Volume/Bottle Construction ^a	Holding Time and Preservation
V-14 – liquid – 1 sample total (test run)	PCE to LDR/Method 8260B or equivalent – RAL	Two 40 mL glass vial or other guidance provided by SAM; no headspace; no chemical preservation due to “waste” classification	
V-14 – solid – 1 sample total (test run)	PCE to LDR/Method 8260B or equivalent – RAL	1, 125 mL wide mouth glass or other guidance provided by SAM; minimize headspace	
V-14 – solid – 1 sample total (test run)	Percent moisture/water content – decant free	As provided by SAM	
V-14 – liquids – 7 samples total (post-treatment)	PCE to LDR/Method 8260B or equivalent – RAL	Two 40 mL glass vial or other guidance provided by SAM; no headspace; no chemical preservation due to “waste” classification	7 days; 4 deg C
V-14 – solids – 7 samples total (post-treatment)	PCE to LDR/Method 8260B or equivalent – RAL	1, 125 mL wide mouth glass or other guidance provided by SAM; minimize headspace	14 days; 4 deg C
V-14 – solids – 7 samples total (post-treatment)	percent moisture/water content – decant free	As provided by SAM	
V-14 – PFLT on solids if required ^b	PFLT/Method 9095A or equivalent	250 mL glass or plastic – minimum of 200 grams or other guidance provided by SAM	None

a. This is guidance; actual field guidance forms specific to the RAL may differ and result in different requirements.

b. Only performed if absence of free liquids cannot be visually ascertained.

4.1.4 Field Equipment Calibration and Set-Up

The industrial hygienist (IH) is responsible for the measurement and evaluation of other personnel exposure chemical hazards.

The radiological control technician (RCT) is responsible for measurement and evaluation of personnel and material radiological contamination. RCT instrumentation calibrations are performed per procedures in Company Manual 15D.

4.1.5 Sample Designation and Labeling

Each sample bottle will contain a label identifying the unique field sample number. Uniqueness is required for maintaining consistency and preventing the same identification code from being assigned to more than one sample. A systematic character code will be used to uniquely identify all samples. The SAM will generate a sampling table, numbers, and labels that correlate directly to characterization sampling. Refer to Appendix C. The information on the label and label placement are as provided in MCP-9228.

4.1.6 Chain of Custody

All samples collected will be managed via chain of custody in accordance with MCP-9228.

4.1.7 Sampling Design and Procedures

Sample collection will involve obtaining containerized, sparged liquid/solid wastes using tools that best accommodate the post-treatment/absorption (PFLT only) composition and accessibility of material, previously discussed. The same tools/approach to be used on the post-treatment sampling activities will be used to support the test run. For post-treatment sampling activities, a minimum of six points from three locations will be sampled. Refer to the physical description discussed in Section 1.2.

Contained waste tends to be nonrandomly heterogeneous in a vertical rather than horizontal direction due to (a) settling of solids and (b) the variation in the waste contents as they enter the container (including changes in waste deposited from one year to another). Theoretically, the wet sparging technique will effectively mix all material in the tank, however, there is no means of proving the resulting homogeneity of waste post-treatment. Therefore, the approach is based on collection of material from multiple areas, selected using a systematic random design, both vertically and horizontally, as physical access permits. All data will be reviewed and compared to determine the tank's overall PCE concentration. Demonstration of LDR compliance will be based upon the mathematical recombination of PCE results for the liquids, solids and any absorbent materials added to solidify free liquids after sparging. Liquids will be collected first from all locations.

The following sentences provide an example of the mathematical recombination referred to in the above paragraph. The final waste stream will be comprised of liquid water, solid sludge, and absorbent materials. The mean concentration of PCE (at the 90% UCL) in each phase will be multiplied by the mass percent that each phase represents of the entire waste stream. Adding these values together provides a reliable estimate of the PCE concentration of the total waste to compare with the LDR treatment standard.

$$C(PCE)(sludge) \times \%sludge + C(PCE)(water) \times \%water + C(PCE)(absorbent) \times \%absorbent = C(PCE) \text{ in final waste form.}$$

4.1.7.1 Remote Access (for VOCs). To access liquid waste remotely from the top of the tank, a **bailer-type sampler/dipper** will be used.

4.1.7.1.1 Bailer-Type Sampler/Dipper—A bailer is a long, thin container attached to a cable or rope that is lowered into water. Because the liquid phase is limited, the bailer used should be capable of bottom filling. A check valve allows water to enter the tool as it is lowered into the tank; when the bailer is lifted, the check valve automatically closes, allowing the water in the bailer to be brought to surface. Bailers are typically only feasible for sampling of small volume liquids. To ensure that the material in a given bottle is representative of surface liquids (there is no reason to suspect any variability over depth or spatially) the material will be transferred from the bailer-type device directly into VOC sample containers with no further disturbance.

Ensure that there are a minimum of three sets of bailer-type devices, rope/cable for each and three compositing containers— decontamination is not feasible. Account for one additional setup of equipment for the test run.

1. Don the PPE required by the health and safety work control provided by the facility.
2. Lower the bottom-filling bailer gently to the water surface and allow to fill. Note: A bailer dropped may cause degassing of water upon impact.
3. Transfer material from the bailer-type device by tilting the tool to allow the liquid waste to flow gently and with minimal disturbance directly into volatile organic analysis (VOA) bottles (a funnel can be used if needed). Fill the sample bottles with no headspace. If necessary, tilt sample bottle to minimize disturbance.
4. Hold the bottle over the waste source or other containment, if possible.
5. Place VOA samples in the cooler immediately after collection.
6. Wipe any sample residue from the sample container with a Teriwipe or equivalent.
7. Cap each bottle as it is filled.
8. Pour any remaining volume back into tank under RC direction, as applicable.
9. For post-treatment sampling, move to next location. Collect duplicate (split) using the same procedures as above on the designated location.

For all sampling wastes, label any material generated with the project name, sample date, requester name and phone number, “pending analysis,” and leave it with the requester, unless otherwise designated in the log notes.

4.1.7.1.2 Procedure Summary—To summarize, this job will be performed as follows:

1. Attend a pre-job briefing given by the facility/project representative. The pre-job briefing will include a review of this Field Sampling Plan and the corresponding project-specific HASP and JSA specific to the activities being performed and will provide all hazards and associated mitigations. The person presenting the pre-job briefing is responsible for ensuring that all the appropriate personnel are invited to attend the pre-job briefing and that training certifications are current for those performing work. The following personnel will be invited: Radiological Control Department,

industrial hygienist, facility supervisor, Safety Department, and Packaging and Transportation Department.

2. The project manager must ensure that the job is on the plan of the day and that support personnel are scheduled. A copy of the facility HASP must be available to ESP prior to sampling for review. ESP generated the JSA attached.
3. Depending on which analysis and phase are being performed (PFLT or VOCs/percent moisture), the tool may vary and will be selected based on capability for retrieving material that is representative of the phases of concern, as already discussed.
4. Radiological Control and Safety personnel will perform any monitoring they deem necessary.
5. Stage equipment as applicable.
6. Don the required PPE defined in the JSA/RWP.
7. Assemble tool for insertion into tank contents.
8. Retrieve material as discussed above. Repeat for the split (duplicate) samples, if applicable.
9. Log physical description of contents.
10. Follow the sample process detailed previously.
11. It is expected that decontamination will not be performed.
12. Accumulate waste, and package it in accordance with WGS instructions.
13. Doff PPE under direction of Radiological Control.
14. Remove samples from the area under direction of Radiological Control.
15. Consult with the Packaging and Transportation Department; finish completing required paperwork, and package and transport samples accordingly. Samples are expected to require radioactive shipment. The WTS can provide an updated source term.
16. Move waste to an approved waste storage area.
17. Enter a physical description in the sample logbook. Include the following: radiation levels on samples, physical consistency/composition, actual tool and approach used, presence of moisture, physical limitations.

4.1.7.1.3 Dipper, Spade, Corer, Auger, Dobbins' tools-For PCE and percent moisture/water content, one sample per location from two angles and a duplicate will be collected for the post-treatment activities. For PFLT, use the same sample locations as other sampling, but no duplicates are required.

1. Access the sample location. It is expected that the sample will be collected from the surface using tools remotely. Ensure that there is adequate equipment to retrieve material for seven sample sets. One additional set for the test run will be required. PFLT, if required, will be performed as a subsequent activity after treatment and absorption.

2. If material is accessed remotely from the top of the tank and is of solid consistency, use a long-handled Dobbins' tool, dipper, auger, spade or equivalent to reach the surface of material. Any coring type of instrument used would generally follow these guidelines.

NOTE: *The Dobbins' tool mockup activities indicate that retrieval of ~90% of solids will be possible; however, if the consistency of material is significantly different than expected, and a full column of material cannot be retrieved, this limitation will be recorded in the sample logbook and brought immediately to the project manager's attention. It is not critical that material be represented from top to bottom for PFLT or percent moisture analyses*

3. Don PPE required by the health and safety work control provided by the facility.
4. Attach auger/coring device head to a section of connecting rod extension. Attach T-handle to the connecting rod, as applicable. Identify the hole and the angle (PCE and percent moisture) which correlate to a given sample set and penetrate material pushing to the bottom of tank. If applicable, manipulate "fins" to capture material in place. If PFLT is required, the same six approximate locations will be used, but collection of material from surface to depth is not critical.
5. Slowly and carefully remove the tool under RC direction.
6. Place core in the sample container or a compositing container, depending on sampling requirements. Retrieve the core, and pull out the Lexan tube, if applicable, capping and sealing both ends. Identifiers with regard to consistency (e.g., hardness, brittleness, compactability, and moistness) will be documented.
7. Change angles (put as much distance between opposite angle as reasonable) and repeat #4, as applicable. Collect duplicate/split sample where applicable.
8. Add tool and associated sampling materials to designated waste stream if decontamination is not feasible.

NOTE: *VOC samples typically are collected as grab samples with special care taken to minimize aeration even though the sparging method is understood to have inherently reduced any VOCs present.*

4.1.8 Sample Transport

Prepare samples for shipment, and complete the applicable shipping papers. Ensure that radiological screening or source term calculation information is provided to comply with shipping requirements. Package samples, and provide packages to Packaging and Transportation shipper for transport in accordance with MCP-9228.

4.1.9 Waste Management

Wastes generated during the characterization project will include various sampling equipment/supplies and PPE. These articles will be handled, characterized, and disposed of in accordance with INL procedures. Waste will be bagged, labeled, and stored in an approved storage area pending disposition. The project manager, with assistance from WGS, will prepare waste determination and disposition forms for determining the disposition routes for all waste generated during sampling analysis.

The analytical laboratory will dispose of samples submitted to them for analyses or return them to the requester as stated in the applicable task order statement (TOS)(s). Samples returned from the laboratory will be accepted only if the original label is intact and legible. If the samples are returned, the project manager is responsible to properly disposition the samples with the assistance of WGS personnel. All waste must be characterized, and WGS personnel must preapprove disposal.

4.2 Sample Analysis

The INL SAM will approve the laboratory performing sample analysis. This laboratory will analyze the samples in accordance with project requirements, including:

- ER-SOW-394, “Idaho National Engineering and Environmental Laboratory Sample and Analysis Management Statement of Work for Analytical Services.”

Project-specific request for analyses forms or TOS(s) identify additional requirements for laboratory analysis. The following sections identify analysis requirements for the characterization project.

4.3 Analytical Methods

To ensure that data of acceptable quality are obtained from the characterization project, standard Environmental Protection Agency (EPA) laboratory methods or technically appropriate methods for analytical determinations will be used to obtain sample data. Analytical methods to be used for this characterization activity are identified in the SAM laboratory contract; the project has requested the use of the onsite laboratory.

Any deviations from this information will be fully documented, and the laboratory will inform the project manager of the deviations.

4.4 Instrument Calibration Procedures

Laboratory instrumentation will be calibrated in accordance with the specific laboratory quality assurance plan. The SAM analytical laboratory authorization processes provide assurance that the analytical laboratories authorized to perform analysis maintain an appropriate laboratory quality assurance plan that addresses instrument calibration.

4.4.1 Laboratory Records

Laboratory records are required to be maintained in accordance with the specific laboratory quality assurance plan. The SAM analytical laboratory authorization processes provide assurance that the analytical laboratories authorized to perform analysis maintain an appropriate laboratory quality assurance plan that addresses laboratory records.

4.4.2 Data Management and Document Control Data Reporting

A 1–2-day turnaround from INTEC will be requested for sample data, (The test run is designed to work out logistics, and as such, is not time dependent). The final data package documentation will conform to the criteria specified in ER-SOW-394. The ER Statement of Work (SOW) prepared by the INL SAM organization is the standard means by which analytical data deliverable requirements are defined by INL projects to laboratories used by the INL. All laboratories used by this project will adhere to the documents used to establish technical and reporting standards.

4.4.3 Data Validation

Analytical data validation is the comparison of analytical results versus the requirements established by the analytical method. Validation involves evaluation of all sample-specific information generated from sample collection to receipt of the final data package. Data validation is used to determine whether analytical data are technically and legally defensible and reliable. The final product of the validation process is the validation report. The validation report communicates the quality and usability of the data to the decision-makers.

The data for this project require Level A validation. The test run data do not require validation.

4.4.4 Data Quality Assessment

The project data quality assessment and validation process is used to determine whether the data meet the project DQOs. Additional steps of the data quality assessment process may involve data plotting, testing for outlying data points, and other statistical analysis relative to the characterization project DQOs.

The data will be assessed to determine data precision, accuracy, representativeness, reproducibility, and completeness in accordance with DOE/ID-10587.

4.4.5 Final Characterization Report

A final characterization report will be prepared for this project per applicable program requirements; Donna Kirchner (6-9873) is the ESP point of contact for review of data and issuance of the closure report summarizing the sampling activity and the findings. The final report will contain a summary of all of the sample data generated during this sampling effort, the log notes, the pertinent notes to the file, the COC forms, and the final sampling plan. The final report will also describe the sample collection effort. A description of the data quality assessment process may also be included. The final report will discuss how the data will be used. The DQOs will be reviewed and evaluated to determine if the characterization project objectives were met.

4.4.6 Document Control

Refer to MCP-9227, “Environmental Services Project Logkeeping Practices” and MCP-9228, “Environmental Sample Management.” Document control consists of the clear identification of all project-specific documents in an orderly form, secure storage of all project information, and controlled distribution of all project information. Document control ensures controlled documents of all types related to the project will receive appropriate levels of review, comment, and revision as necessary. The project manager is responsible for properly maintaining project documents according to INL document control requirements. Upon completion of the characterization project, all project documentation and information will be transferred to compliant storage according to project, program, and company requirements. This information may include field logbooks, COC forms, laboratory data reports, engineering calculations and drawings, and final technical reports.

5. HEALTH AND SAFETY REQUIREMENTS

As previously discussed, this sampling activity will be covered under the ICDF HASP (INEEL/EXT-01-01318) and the ESP JSA form in Appendix B. Work will also be governed under a task-specific Radiation Work Permit (RWP). The MCP-3562 hazard evaluation group representatives will review work control documents to ensure that all sampling hazards are addressed and mitigated. All job

hazards, along with corresponding mitigation requirements, are documented on a JSA form (attached following) per MCP-3450, “Developing and Using Job Safety Analyses.”

The persons identified in Section 2 and by the project are identified in the review process and their concurrence with this plan is documented through approval signatures reflected on Document Action Request (DAR)124825 and JSA form in Appendix B which is an appendix in this document.

6. REFERENCES

DOE/ID-10381, *INEEL Waste Acceptance Criteria* (WAC), current issue.

DOE/ID-10587, *Quality Assurance Project Plan for Waste Area Groups 1,2,3,4,5,6,7,10 and Deactivation, Decontamination, and Decommissioning*, Rev. 8, March 2004.

EDF-4830, “Waste Generator Services Closure Report for the Contents of the PM-2A Tanks (TSF-26).”

ER-SOW-394, “Idaho National Engineering and Environmental Laboratory Sample and Analysis Management Statement of Work for Analytical Services.”

GDE-152, “Collecting Samples Using a Hand Auger.”

GDE-162, “Decontaminating Sample Equipment.”

ICP-MCP-9439, “Environmental Sampling Activities at the INEEL.”

MCP-3003, “Performing Pre-Job Briefings and Documenting Feedback.”

MCP-3450, “Developing and Using Job Safety Analyses.”

MCP-3472, “Identification and Characterization of Environmentally Regulated Waste.”

MCP-3562, “Hazard Identification, Analysis and Control of Operational Activities.”

MCP-9227, “Environmental Services Project Logkeeping Practices.”

MCP-9228, “Environmental Sample Management.”

Reese and Rodriguez, 2000, *Data Quality Objectives Summary Report for the PM-2A Tanks (TSF-26)*

Services Authorization Form 3469.

Smith, 1980, *Final Report—Decontamination and Decommissioning of TAN Radioactive Liquid Waste Evaporator System (PM-2A)*.

STD-101, “Integrated Work Control Process.”

TEM-104, “Model for Preparation of Characterization Plans.”

Appendix A

Hazard Screening Checklist
(Example Form)

Hazard Screening Questions		CHECK BOX IF VALID		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)				
		S	IH	RAD	ENV	ENG	FP	Other
Industrial Safety								
1.*	Will the operational activity involve operating any machinery with mechanical rotating motion?			X				
2.*	Does the operational activity require the employee to operate on or near unguarded, operating, rotating equipment or with pinch points or sharp edges (<i>near</i> is the distance where an individual or tool could contact the piece of equipment)?		X	X				
3.*	Will the operator be exposed to the danger of striking against, being struck by, or making harmful contact with an object (i.e., overhead obstructions, falling objects)?			X				
4.*	Can the operator be caught in, by, or between objects?			X				
5.	Does the operational activity involve hoisting and rigging or material handling?			X				
6.	Will the hoisting and rigging involve a critical lift?			X				
7.	Does the operational activity have the potential to contact an overhead or suspended obstruction (such as overhead wires, low clearances, etc., along route of travel)?			X				
8.*	Will the operational activity involve work on a non-isolated (energized without LO/TO performed) electric circuit > 50 V (ac or dc) other than troubleshooting, diagnostics, or calibration activities?			X				
9.	Will the operational activity involve work on an isolated electric circuit > 50 V (ac or dc)?				X			
10.	Does the activity involve operating where personnel or equipment can make contact with distribution system equipment while operating within 50 feet of an overhead high voltage transmission line?				X			
11.*	Does the operational activity involve an elevated platform (6 feet above normal walking surface level)?			X	X			
12.*	Is scaffolding required for this operational activity?			Maybe	X			
13.*	Will ladders be used to operate above 6 feet to perform this activity?			Maybe	X			

Hazard Screening Questions		CHECK BOX IF VALID		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)				
		S	IH	RAD	ENV	ENG	FP	Other
14.*	Is the operational activity being performed on a roof?		X					
15.*	Will the operational activity require access into, or operation near pits, excavations, or other fall hazards greater than 6 feet?		X	X	X			
16.	Is an aerial platform to be used for this operational activity (i.e., boatswain's chair, vehicle-mounted devices, telescopes or articulating boom, or vertical tower)?	Maybe	X					
17.	Does the operational activity involve the potential for permanent or temporary electrical conductors to be exposed to liquids causing an electrical hazard (for example, cleaning an area with a water hose in a manner that may cause water to enter an electrical junction box, opening a liquid line where fluid may run onto an electrical junction box, laying extension cords in water)?		X			X		QA
18.	Is the operational activity to be performed on lead-acid batteries?		X	X		X		X
19.*	Will the operational activity involve uncharacterized or unknown chemical hazards (such as suspected container mislabeling, abandoned pipes/equipment, etc.)?		X	X		X		X
20.*	Will soil be disturbed to a depth greater than 6 in. (mechanical excavation) or 12 in. (hand excavation)?		X			X		
21.*	Is the operational activity performed within a CERCLA hazardous waste cleanup site?		X	X	X			
22.	Will the operational activity block a road or access to a facility?		X				X	EM/SEC
23.*	Will this operational activity create tripping hazards or occur in an area with an unstable surface for personnel to stand or walk on?		X	X				
24.*	Is the operational activity being performed as field operations (operations outside of a facility boundary area)?		X			X		EM
25.*	Will the operational activity involve heavy industrial vehicles (i.e., fork lifts, heavy vehicles designed to operate within off-highway job sites, scrapers, bulldozers, tractors)?		X					
26.*	Will the operational activity occur in an area with potential drowning hazards?		X					EM

Hazard Screening Questions		CHECK BOX IF VALID		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)				
		S	IH	RAD	ENV	ENG	FP	Other
27.	Will the operational activity involve a piping system containing liquid with size and velocity great enough to create a potential flooding hazard if the system has a large leak?		X					
28.	Are coded (ASME, etc.) pressure vessels, systems, or relief devices included in the operational activity scope?		X			X		QA
29.	Will the operational activity involve movement of compressed gas cylinders?		X	X	X		X	
30.	Will the operational activity involve the design, construction/assembly, or modification of a system or equipment that has the capability of operating at a <i>high pressure</i> (see def.)?		X			X		QA
31.	Does the operational activity involve operating a high pressure system greater than 15 psig?		X				X	
32.	Does the operational activity involve operating a high temperature system greater than 125°F in which a person could come into physical contact with an uninsulated surface?		X					
33.	Does the operational activity involve using cryogenic systems or chemicals exhibiting cryogenic properties?		X	X				
34.*	Does the operational activity involve surface preparation, including grinding, abrasive blasting, scabbling, or chipping?		X	X		X		
35.*	Is the operational activity performed within a RCRA Treatment, Storage, and Disposal Facility?		X	X		X		
Industrial Hygiene								
36.*	Does the operational activity include the manual lifting of heavy objects?		X	X	X			
37.*	Does the operational activity have ergonomic hazards present (e.g., repetitive motion, excessive manual force, awkward or static postures, contact stress on body, vibration, system not accommodating employee physical shape)?		X		X			
38.*	Will the operational activity create or occur in an area with inadequate lighting?				X			
39.	Will a fossil fuel powered engine be used inside a facility?		X	X		X		

Hazard Screening Questions		CHECK BOX IF VALID						SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)			
		S	IH	RAD	ENV	ENG	FP	Other			
40.	Is there a potential to release a hazardous substance to a space in a quantity sufficient to exceed atmosphere immediately dangerous to life or health (IDLH) (e.g., O ₂ deficiency, carbon monoxide, CO ₂ , release of toxic gases)?		X								
41.*	Does the operational activity involve entry into a non-permit-required confined space?		X	X							
42.*	Does the operational activity involve entry into a permit-required confined space?		X	X							
43.*	Will this activity expose operators to an extreme temperature environment or expose operators to conditions that prevent the body from maintaining proper body temperature (e.g., hot weather, outside operations in the winter; wearing of PPE)?	X		X							
44.*	Is the operations area posted as a high noise (greater than 85 dB.) area, or will the operational activities produce high noise levels?	X, if sparge		X							
45.*	Is the operational activity likely to result in an inhalation or skin exposure to dust, mists, or ashes?		X								
46.*	Will the operational activity disturb or have the potential to disturb areas contaminated with rodent feces or urine?		X								
47.*	Will the operational activity expose or have the potential to expose operators to blood and/or other potentially infectious materials that require BSL-3 controls?		X								
48.*	Will the operational activity affect HEPA filtration?		X		X						
49.*	Will the operational activity affect HVAC or local exhaust systems used to control exposures to hazardous substances?		X			X					
50.*	Will the operational activity affect facility HVAC flow paths or velocities in a building containing Radiologically Controlled Areas (RCAs)?		X	X			X				
51.*	Will this operational activity involve handling beryllium or beryllium-contaminated equipment?		X								
52.*	Will the operational activity involve the handling or storage of a carcinogen (as identified on the MSDS)?		X								

Hazard Screening Questions		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)						
	CHECK BOX IF VALID	S	IH	RAD	ENV	ENG	FP	Other
53.*	Will this operational activity involve handling lead, lead products, or lead-contaminated equipment that could pose an inhalation, ingestion, or injection hazard?		X		X			
54.*	Will this operational activity involve handling cadmium, cadmium products, or cadmium-contaminated equipment that could pose an inhalation, ingestion, or injection hazard?			X				
55.*	Could the operator's eyes or skin be exposed to toxic or corrosive chemicals?		X					
56.*	Does the chemical inventory exceed the threshold quantity in 29 CFR 1910.119 (Section (a)(ii) and Appendix A) in a nonnuclear facility?		X					SA
57.*	Will the operational activity involve exposing employees to non-ionizing radiation (for example, microwave, radio frequency energies)?			X				
58.	Will the operational activity involve Class II, III, or IV lasers?			X				
Fire Protection/Chemical Safety/Explosive Safety								
59.	Does this operational activity involve installing or relocating a temporary facility/structure?			X	X		X	X
60.	Will the operational activity modify fire loading or building structures such as walls, ceiling, aisle space, floors, and doors?		X			X	X	X
61.	Will the operational activity create or disturb a potentially explosive dust?		X	X				X
62.	Will the operational activity involve cutting, welding, grinding, or plasma arc cutting inside an approved welding area?		X	X				X
63.	Will this operational activity involve use of flammable materials near an ignition source, such as static electricity, furnaces, hot plates, sparks, and open flames (excluding welding/cutting)?		X					X
64.	Will the operational activity require dispensing or bulk handling of flammable and combustible liquids (excluding fueling vehicles)?		X	X				X
65.	Does this operational activity involve pyrophoric material?		X					X

Hazard Screening Questions		CHECK BOX IF VALID						SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)			
		S	IH	RAD	ENV	ENG	FP	Other			
66.	Does this operational activity require using Class I or Class II explosives (including squibs), munitions, or pyrotechnics?		X						X		SEC SA
67.	Will this operational activity be performed on the firing range or involve firearms?		X						X		SEC
68.*	Will the operational activity involve the storage of hazardous materials?		X		X						
69.	Are other chemicals stored or used near the operational activity that could reasonably impact the activity (or vice versa)?		X		X						
70.	Do the chemicals required by the operational activity exceed the threshold quantities of the facility safety analysis report or emergency preparedness hazard evaluation?		X						X		EM
71.	Does the operational activity involve purchase, use, or storage of chemical products, chemicals, or hazardous agents?		X		X				X		
72.	Does the chemical(s) used for the operational activity have a flammability rating greater than 1 using the NFPA 704 Hazard Identification system?								X		
73.	Does the chemical(s) used for the operational activity have a reactivity rating greater than zero for any of the identified chemicals?			X					X		
74.	Does the chemical(s) used for the operational activity have a special rating for any of the listed chemicals?			X					X		
75.	Does the operational activity involve use of a chemical without an NFPA 704 (Hazard Identification System) description on the MSDS?		X						X		
76.	Will the operational activity disable the fire protection suppression/detection systems (i.e., underground fire mains, fire suppression, fire alarms, etc.)?								X		EM
77.	Will the operational activity block or obstruct an aisle, entrance, exit, or safety equipment?			X					X		EM

Hazard Screening Questions

	CHECK BOX IF VALID	SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)					
		S	IH	RAD	ENV	ENG	FP
Environmental							
78.*	Will the operational activity involve excavations, trenching, drilling, geoprobe sampling, or any other disturbances of soil or altering a stream channel or bed?		X	X		X	
79.	Will the operational activity procure, apply, or store pesticides (e.g., herbicides, rodenticide, fungicides, insecticides, bactericides), or apply fertilizers?			X	X		X
80.	Will the operational activity involve procuring goods and services?	X				X	
81.	Will the operational activity involve excavation in an area adjacent to an underground contamination or CERCLA area?		X		X	X	
82.	Does the operational activity involve planning to generate or generating a waste?		X			X	
83.	Will the operational activity involve dispositioning excess materials?	X				X	
84.	Will the operational activity involve constructing or modifying sewage and other wastewater systems?					X	
85.	Will the operational activity involve removing lead from service or from a structure, or classifying newly discovered lead.					X	
86.	Will the operational activity involve using and storing product lead.					X	
87.	Will the operational activity involve shipping product lead off-site for direct reuse (that is, no reclamation) at another facility?					X	
88.	Will the operational activity involve discharging new wastewaters or changing discharges to the city of Idaho Falls sewer system?				X	X	X
89.	Will the operational activity involve discharging wastewaters to the City of Idaho Falls sewer system?				X	X	X
90.	Will the operational activity involve monitoring wastewater discharges to the City of Idaho Falls sewer system?				X	X	X
91.	Will the operational activity involve exceeding wastewater discharge limits to the City of Idaho Falls sewer system?				X	X	X

Hazard Screening Questions		CHECK BOX IF VALID		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)				
		S	IH	RAD	ENV	ENG	FP	Other
92.	Will the operational activity involve discharging wastewaters at the INEEL Site or operating wastewater land application facilities?			X	X	X		
93.	Will the operational activity involve reporting water consumption?				X	X		
94.	Will the operational activity involve performing site studies for new buildings or structures?				X	X		
95.	Does the operational activity construct or modify facilities, equipment, or processes (including changes to operational conditions)?		X	X	X	X		QA
96.	Will the operational activity involve operating facilities, equipment, or processes within the storm water corridor?				X			
97.	Does the operational activity respond to a regulatory inspection?					X		
98.	Will the operational activity involve maintaining and repairing facilities, processes, and equipment?					X	X	
99.*	Will the operational activity break up, dislodge, disturb, or block access to regulated asbestos-containing material?			X		X		
100.*	Will the operational activity involve removing asbestos-containing material?							
101.	Does the operational activity involve monitoring stormwater according to the Storm Water Pollution Prevention Plan for Industrial Activities?						X	
102.	Will the operational activity involve manufacturing wood furniture and wood furniture components?						X	
103.	Will the operational activity involve removing brake pads?						X	
104.*	Will the operational activity involve maintaining equipment containing, or contaminated with polychlorinated biphenyls?			X		X		
105.*	Will the operational activity involve decontaminating equipment containing or contaminated with PCBs?				X		X	
106.	Will the operational activity involve constructing or modifying facilities that store oil in containers?						X	

Hazard Screening Questions	CHECK BOX IF VALID						SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)			
	S	IH	RAD	ENV	ENG	FP	Other			
107. Does the operational activity involve operating stationary, portable, or mobile facilities or equipment that store oil in containers?				X						
108. Will the operational activity involve constructing or modifying drinking water systems?			X							
109.* Does the operational activity involve operating or sampling drinking water systems or exceeding permitted or regulated drinking water limits?			X							
110. Will the operational activity involve maintaining and repairing drinking water systems?			X							
111. Does the operational activity involve preparing buildings or facilities for transfer to surplus or standby (inactive) status?			X							
112. Does the operational activity involve reactivating buildings or facilities from standby (inactive) status?			X							
113. Will the operational activity involve deactivating, decontaminating, dismantling, or closing facilities (including trailers), equipment, and processes.			X							
114. Will the operational activity involve relocating portable air emission sources, or bringing portable or stationary air emission sources onto the INEEL?			X							
115. Will the operational activity involve constructing or modifying stationary air emission sources?			X							
116. Does the operational activity involve startup, shutdown, or performing scheduled maintenance on stationary air emission sources?			X							
117. Does the operational activity involve operating stationary facilities and equipment that emit air pollutants?			X							
118. Does the operational activity involve operating stationary facilities and equipment that emit radionuclides?			X							
119. Does the operational activity maintain, test, dispose, remove, add, or breach halon systems or halon-containing equipment?			X		X					
120. Will the operational activity involve performing activities with the potential for fugitive dust or fugitive emissions?			X							

Hazard Screening Questions	CHECK BOX IF VALID	SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)					
		S	IH	RAD	ENV	ENG	FP
121. Will the operational activity involve conducting open burning?					X		X
122. Will the operational activity involve purchasing Diesel fuels?					X		X
123. Will the operational activity involve maintaining and repairing motor vehicle gasoline station pumps?					X		
124. Will the operational activity exceed permitted or regulatory limits for air emissions?					X		
125.* Does the operational activity involve procuring external laboratory services for waste characterization?		X			X		
126. Will the operational activity involve procuring off-site waste management and recycling services?				X			
127. Will the operational activity involve purchasing refrigerants, appliances containing refrigerants, system components that operate equipment that uses refrigerants, or refrigerant recovery or recycling equipment?				X			
128. Will the operational activity involve maintaining, servicing, or repairing stationary heating, ventilation, air conditioning, and refrigeration (HVACR) equipment?				X			
129. Will the operational activity involve maintaining, servicing, or repairing motor vehicle air conditioners?				X			
130. Will the operational activity involve distributing, excessing, or disposing of appliances containing refrigerants?				X			
131. Will the operational activity involve leasing, renting, or transacting real property?				X			
132. Will the operational activity involve conducting new or modifying existing research and development (R&D) activities, including indoor bench-scale and small-scale R&D activities, and small-scale projects?				X		X	X
133. Will the operational activity involve constructing or modifying septic tanks or systems?					X		
134. Will the operational activity involve discharging to septic tanks/systems?					X		

Hazard Screening Questions	CHECK BOX IF VALID	SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)					
		S	IH	RAD	ENV	ENG	FP
135. Will the operational activity involve maintaining and repairing septic tanks or systems?					X		
136. Will the operational activity involve pumping septic tanks?				X			
137. Will the operational activity involve abandoning or closing septic tanks?			X				
138. Will the operational activity involve reporting and cleaning up spills and releases?		X		X			
139. Will the operational activity involve cleaning up spills and releases for PCBs?			X		X		
140. Will the operational activity involve constructing or modifying aboveground storage tanks and non-regulated underground storage tanks?				X		X	
141. Will the operational activity involve operating aboveground storage tanks and non-regulated underground storage tanks?				X			
142. Will the operational activity involve repairing aboveground storage tanks and non-regulated underground storage tanks?					X		
143. Will the operational activity involve changing use or reactivating aboveground storage tanks and non-regulated underground storage tanks?					X		
144. Will the operational activity involve discontinuing use of, closing, relocating, or removing aboveground storage tanks and non-regulated underground storage tanks?					X		
145. Will the operational activity involve constructing or modifying regulated underground storage tanks?						X	X
146. Will the operational activity involve operating and maintaining regulated underground storage tanks (USTs)?						X	
147. Will the operational activity involve repairing regulated underground storage tanks?						X	
148. Will the operational activity involve release, leaks, spills, or unusual operating conditions from regulated USTs?						X	

Hazard Screening Questions		CHECK BOX IF VALID						SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)			
		S	IH	RAD	ENV	ENG	FP	Other			
149.	Does the operational activity involve changing use or reactivating regulated USTs?				X						
150.	Does the operational activity involve temporarily discontinuing use of or temporarily closing regulated USTs?				X						
151.	Will the operational activity involve discontinuing use of, closing, relocating, or removing regulated USTs permanently?			X							
152.	Does the operational activity involve operating volatile organic storage tanks?		X								
153.	Will the operational activity involve constructing or modifying facilities, equipment, or processes at Permitted or Interim Status RCRA facilities?			X							
154.	Will the operational activity involve operating solid waste management units?			X							
155.	Will the operational activity involve discontinuing use of, or closing, facilities, equipment, or processes at RCRA Interim Status or Permitted facilities?			X							
156.	Will the operational activity involve constructing or modifying water wells?			X							
157.	Will the operational activity involve protecting wellheads?			X							
158.	Does the operational activity involve closing and abandoning wells?			X							
159.	Will the operational activity involve constructing or modifying injection wells?			X							
160.*	Does the operational activity involve operating and sampling permitted injection wells?										
161.	Will the operational activity involve operating a shallow injection well not requiring a permit?						X				
162.	Will the operational activity involve closing or abandoning injection wells?						X				

Hazard Screening Questions

		CHECK BOX IF VALID		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)				
		S	IH	RAD	ENV	ENG	FP	Other
Radiological								
163.*	Will this operational activity be performed inside of a Radiological Buffer Area?			X				
164.*	Does this operational activity involve moving, handling, processing, or transporting Special Nuclear Material, transuranic (TRU), or transuranic/mixed (TRU/M) material?			X	X			
165.*	Will this operational activity be performed inside of a Radiological Material Area, or Radiological Material Storage Area?			X				
166.*	Will this operational activity be performed inside a known or suspected High Contamination Area, Fixed Contamination Area, Contamination Area, or Airborne Radiological Area?		X		X			
167.*	Will this operational activity be performed inside of a Radiation Area?				X			
168.*	Will this operational activity be performed inside of a known or suspected High Radiation Area or a Very High Radiation Area?	X			X			
169.*	Will welding, grinding, cutting, or other treatment be performed on or near a surface in a manner that contamination could be hidden or become airborne?		X	X	X		X	
170.	Will a new process or equipment be introduced that will be used to contain or transport radioactive materials?				X	X	X	
171.	Will the operational activity involve moving a component, system, or equipment that has the potential for internal contamination?	X		X	X			
172.*	Will the operational activity require handling or usage of radiologically controlled materials?					X		
173.*	Does this operational activity involve use of radioactive sources, radiation-producing devices, or devices that contain radioactive sources (e.g., radiography, x-ray machines)?					X		
174.*	Will the operational activity involve the transfer, pumping, or draining of radioactive or radioactively contaminated liquids (including stormwater)?	X		X	X	X		
175.*	Does this operational activity involve radioactive or radioactive mixed wastes?	X		X	X	X		WGS

Hazard Screening Questions		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)							
		CHECK BOX IF VALID	S	IH	RAD	ENV	ENG	FP	Other
176.	Will the operational activity require installation, fabrication, modification, or removal of reflectors, shielding, or moderators (lead, steel, liquid, polyethylene, etc.)?		X	X	X		X		QA CRIT
177.	Does this operational activity involve fissile material that may require criticality controls?				X				CRIT
Safety Analysis									
178.	Does the planned operational activity affect change of fissile material, moderator, or reflector quantities or location within a Criticality Control Area (CCA)?				X				QA CRIT
179.	Could this operational activity possibly cause a false criticality evacuation alarm or otherwise require changes to current criticality alarm system operation?				X		X		EM QA CRIT
180.	Could this operational activity possibly affect the capability of the Criticality Alarm System (CAS) to detect a criticality accident?				X		X		QA CRIT
181.	Does this operational activity affect the capability of an engineered safety feature or administrative control to prevent or mitigate a criticality accident?				X		X	X	QA CRIT
Safety Basis Documents									
182.	Does this operational activity require shutdown or disabling of equipment important to safety identified in the facility-specific authorization basis?				X		X		EM
183.	Does this operational activity alter the consistency of the design requirements, physical configuration, or documentation of the system, structure, and component (SSC) designated for configuration management?						X		
184.	Will the operational activity disable emergency communications or evacuation systems?						X		EM
185.	Will the operational activity create new Hazard Controls or have an operational impact on on Hazard Controls for a nonnuclear facility (radiation sources or devices, chemicals, biological agents, or explosives exceeding the thresholds in MCP-2451, Appendix A)?								SA

Hazard Screening Questions	CHECK BOX IF VALID	SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)					
		S	IH	RAD	ENV	ENG	FP
Quality							
186. Does this operational activity involve Quality Level 1 or 2 systems or require inspection/testing by QA/QC personnel to design, code, or regulatory standards?							QA
187. Does the operational activity involve changes to process computer software?			X				QA
188. Does this operational activity involve welding specifications, torque values, or electrical/electronic fabrication requirements?							QA
189. Is the operational activity associated with the Spent Nuclear Fuel Program and subject to DOE/RW-0333P (check with requester if unsure)?							QA/CRIT
190. Does the operational activity involve any external interfaces between organizations or internal interfaces between organizational units?	X						QA
191. Does the operational activity take exception to the requirements contained in the QA PRDs (PRD-5071 through PRD-5093)?							QA
192. Does the operational activity involve personnel performing or managing activities affecting quality?							QA
193. Does the operational activity involve a design input, design change, inspection, test acceptance, or implementation of configuration management?		X					QA
194. Does the operational activity involve procurement of items or services, or development or review and approval of procurement documents?	X						QA
195. Will the operational activity require updating or revising of applicable and/or associated instructions, procedures, and/or drawings?							QA
196. Does the operational activity involve identifying, storing, and/or controlling items?	X						QA
197. Does the operational activity involve controlling special processes that affect the quality of and/or services? (Examples include welding, brazing, heat treatment, nondestructive examination, hydrostatic testing, soldering, fiber optic cable splicing, chemical cleaning, special coatings.)				X			QA

Hazard Screening Questions		CHECK BOX IF VALID		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)				
		S	IH	RAD	ENV	ENG	FP	Other
198.	Does the operational activity involve planning, performing, and/or reporting inspections used to verify the acceptance of items or activities?							QA
199.	Does the operational activity involve planning and/or executing tests that are used to verify conformance of an item to specified requirements, or to demonstrate satisfactory performance for service?							QA
200.	Does the operational activity involve the use of measuring and test equipment?							QA
201.	Does the operational activity involve handling, storing, cleaning, packaging, shipping, and/or preserving items to prevent damage or loss and/or minimize deterioration?	X						QA
202.	Does the operational activity involve controlling an inspection, test, and/or operating status of items during receipt inspection, construction, fabrication, operation, maintenance, and/or decommissioning phases of facilities for which the company has responsibility?							QA
203.	Does the operational activity involve controlling items that do not conform to specified requirements to prevent their inadvertent installation or use?							QA
204.	Does the operational activity involve identifying, administrating, and/or storing documents designated as quality records?	X						QA
Security								
205.	Does the operational activity interrupt or disable a security system?							SEC
206.	Will the operational activity occur in secured areas with special access requirements or be performed by personnel not security briefed for the area?							SEC
207.	Does this operational activity involve the use of ESS, Simmunition, or other training firearms and ammunition?	X						SEC
208.	Does operational activity involve tactical operations, or individual or team movement?		X					SEC
209.	Does this operational activity involve the use of specialized equipment, Night Vision, Thermal Imagers, or breaching equipment, etc.?	X						SEC

Hazard Screening Questions		CHECK BOX IF VALID		SUBJECT MATTER EXPERT SUPPORT (see legend at end of form)					
		S	IH	RAD	ENV	ENG	FP	Other	
210.	Does this operational activity involve non-normal vehicle operations such as vehicle stops or other tactical operations involving vehicles?		X					SEC	
211.	Will the employees in adjacent areas be reasonably expected to be exposed to hazards resulting from the proposed operational activity, requiring additional non-routine mitigation?		X	X				EM	
Other									

LEGEND
 * - mitigation Guide will provide additional criteria for SME involvement

CRIT—Criticality Safety
 EM—Emergency Management
 ENG—Engineering (system or discipline)
 ENV—Facility Environmental Support
 FP—Fire Protection (includes reviews by fire protection engineers, chemical safety, explosive safety professionals)
 IH—Industrial Health
 NOTE: The HMG is a compilation of the mitigations and controls based on company requirements. Only the applicable items are incorporated into work control document. Equivalency training MAY be used in lieu of the training identified. The final approved JSA developed by the HEG incorporates the appropriate HMG requirements based on SME (identified in Appendix C) input from an evaluation of the job scope and worksite hazards.
 NOTE: If any of the following criteria apply to the proposed operational activity,
THEN contact the area outage coordinator to determine if Form 433.01, Outage Request, must be processed

- Requires temporary removal from service of any system, equipment, or facility/area that will cause a significant reduction or interruption of service to other systems, organizations, departments, or facilities
- Safety documentation or procedures requires an outage request form for the equipment, system, or facility
- Will hinder an organization or activity area to provide or receive routine services necessary for significant number of employees to perform their activities.
- Reduction in utility service has the potential to impact future operability or cause failure of system loads or components when commencing or recovering from the reduction in utility service
- All outages will be evaluated against approved configuration controlled drawings. If accuracy of drawings is suspect, the planning team must walkdowns affected systems and components to ensure all the outage isolation points and affected systems and components are positively identified.

Instructions must identify all outage isolation points and recovery requirements.
 Instructions must incorporate the appropriate controls and contingencies to ensure safety of the public, employees, and environment when the outage affects the Emergency Control Center or other vital/essential systems or components.

Appendix B

Job Safety Analysis

JOB SAFETY ANALYSIS

Job/Title	Field Sampling Plan for Group 3, PM-2A Tank V-14 Treated Contents for Test Area North, Waste Area			JSA Number	Revision				
Facility/Project & Location		Effective Date	Expiration Date	Facility/Project Management/Supervisor Approval	/	Date			
Tank is stored at ICDF, under management of Stoller		2/7/05	2/7/06	Gerry Streier (ICDF Project Manager)	G. Streier via email #	8-2-05			
SME APPROVAL (A "Yes" response requires a signature and date.)									
No	Yes	SME	Signature	Date	No	Yes	SME	Signature	Date
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Industrial Safety	<i>L. McNamee via email #</i>	8-2-05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Env. Protection	<i>M. Helzen via email #</i>	8-2-05
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Industrial Hygiene	<i>D. Johnson via email #</i>	8-2-05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Quality Assurance	<i>R. Allen via email #</i>	8-2-05
<input type="checkbox"/>	<input type="checkbox"/>	Fire Protection			<input type="checkbox"/>	<input type="checkbox"/>	Engineering		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	RCT/RAD Eng.	<i>A. McKibney via email #</i>	8-2-05	<input type="checkbox"/>	<input type="checkbox"/>	Other: EM		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other: WTS	<i>R. Romine via email #</i>	8-2-05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other: RAD Eng.	<i>J. Holton via email #</i>	8-2-05
Briefly Describe The Job and Expected Result									
Access the contents of Tank V-14 for sampling of pre-treatment "test run" and post-treatment media. Access the contents of Tank V-14 for sampling of post-treatment stabilized media. Based on mockup activities performed by the project, discussion of media both wet and dry is included since the composition of material post-treatment is expected to result in two distinct phases. Additionally, PFT samples of the post-treatment stabilized material may be required and that material will be solid. Discussion of sample collection from the top of the tank is expected.									
Required Job Training/Required Personal Protective Equipment									
TRN-732 - to attend prejob; TRN-754 or QLPREJOB - to present prejob; training to facility-specific HASP; OSHA 40 hour QLHAZ40C - all samplers; OSHA Super QLHAZ40S - job site supervisor; DOT qual QLHZMT01 - for person responsible for shipment; Rad II worker QL00RAD2 - all samplers; Medic First Aid QL000AID/QL000CPR or TRN87 - one sampler; Respirator or TRN147, if applicable - one sampler; Heat/Cold Stress SMTT0010 - all samplers; TRN-288 PPE or equivalent - all samplers; Glovebag Use - QL000617, TRN192 or equivalent, if applicable; ergonomics to be provided specific to job by onsite Safety professional; Stop Work Authority TRN604 or equivalent QL000ESH - Safety and Health Access - all samplers; INTEC TSD Worker QLCPPPTSD - all samplers; QLFPARWK or TRN57 - At risk worker fall protection, if applicable; QLSCAFUS or TRN20 - Scaffold User, if applicable; Ladder Use SMTT0006 or equivalent, if applicable.									

JOB SAFETY ANALYSIS

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
<p>1. Job site supervisor will provide prejob briefing to all personnel supporting the work activity.</p> <p>2. Gain access to the liquid or solid material after selecting the appropriate tool for sample collection. Pull samples as discussed in Section 4 of this plan. Decontaminate or dispose of tools. Containerize waste. Prepare samples for shipment.</p>	<p>1. None</p> <p>2a. Pinch point or sharp edges may be present either on the tools or at the physical access point.</p>	<p>1.Prefab will be provided by ICDF personnel in compliance with MCP-3003. At this time, the physical access to and consistency of the tank contents should be fairly well understood and the appropriate tools/approach will be discussed as part of the prejob.</p> <p>2a. Workers will be cognizant of hazards associated with the use of tools or access to the sample ports. If necessary, leather gloves will be worn.</p>
	<p>2b. Sampling activities may be required from an elevated platform.</p> <p>2c. Sampling activities may require scaffolding. Scaffolding must be inspected before use prior to each shift by a competent person. A tag indicating the inspection must be attached to the scaffolding. Loads in excess of 50lbs/sqft must not be placed on the scaffold planking.</p> <p>2d. Sampling may require ladders at >6 ft to access sample ports. A fall hazard of >6 ft may be present depending on how ICDF prepares access to the tank contents.</p> <p>2e. Sampling activities may require an aerial platform or device similar to a Genie lift.</p> <p>2f. Sampling may occur in an area with tripping hazards or an unstable surface.</p> <p>2g. Sampling will occur outside of a facility boundary area.</p> <p>2h. Handling of samples may require lifting of heavy objects and ergonomic hazards, such as awkward positions, may be present.</p>	<p>2b. Workers may be required to use fall protection (see training designation above) or other fall protection guards as determined by project health and safety personnel.</p> <p>2c. Workers may be required to use scaffolding (see training designation above) or other fall protection as determined by project health and safety personnel.</p> <p>2d. If ladder use at >6 ft is required, workers will have ladder training (as designated above) and other fall protection may apply as determined by the project health and safety personnel. Place all tools and equipment up on scaffolding prior to accessing scaffold ladder in order to maintain 3 points of contact with ladder.</p> <p>2e. Workers may be required to use fall protection (see training designation above) or other fall protection guards as determined by project health and safety personnel.</p> <p>2f. Workers will inspect the area and remove, if possible, any tripping hazards or otherwise become cognizant of tripping/unstable surface hazards.</p> <p>2g. Any special access/security requirements will be discussed in addition to compliance to MCP-2725, Field Work, if applicable.</p> <p>2h. Workers will take care not to lift >50 lbs or no more than 1/3 of their body weight, whichever is less, and implement the buddy system. Rotation of job activities may be required to mitigate for ergonomic hazards. As well as possible, the job should be configured to prevent against awkward positions.</p>

JOB SAFETY ANALYSIS

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
Step 2 continued.	<p>2i. Sampling may expose ESP personnel to extreme temperatures or conditions. If sparging continues during sampling, as expected, high noise may be a hazard.</p> <p>2j. This activity involves the procurement of goods and external laboratory services for waste characterization. The activity involves external interfaces between multiple organizational units.</p> <p>2k. The activity will result in generation of a waste, including possible disposition of excess sample material.</p> <p>2l. The activity will be performed in a known high contamination/radiation area.</p> <p>2m. The activity, depending on the material consistency and the tool selected for sample retrieval, could involve moving equipment that has the potential for internal contamination.</p> <p>2n. The sampling activity may involve the transfer, pumping, or draining of radioactive or radioactively contaminated liquids.</p> <p>2o. The sampling activity may involve radioactive or radioactive mixed wastes.</p> <p>2p. The activity will involve procurement of items or services; involve identifying, storing or controlling items; involve handling, storing, cleaning, packaging, shipping and/or preserving items to prevent against damage or loss and/or minimization of deterioration; and involves identifying, administering, and/or storing documents designated as quality records.</p> <p>2q. The activity will involve walking and working in area of uneven terrain.</p>	<p>2i. Workers will have training (see designation above) and will wear clothing appropriate for conditions, including hearing protection. IH may monitor if considered necessary.</p> <p>2j. Environmental and Quality personnel constitute part of the hazard evaluation group (HEG) to address these potential quality issues.</p> <p>2k. WGS personnel constitute part of the (HEG) to address appropriate waste disposition activities.</p> <p>2l. Radiological control personnel constitute part of the HEG to direct work in a safe manner consistent with ALARA. An RWP may be required.</p> <p>2m. RC personnel will direct handling of all equipment in a manner that prevents against contamination to personnel or the environment. An RWP may be required.</p> <p>Sampling personnel will have the radiological training designated above.</p> <p>2n. RC personnel will direct handling of all equipment in a manner that prevents against contamination to personnel or the environment. An RWP may be required.</p> <p>Sampling personnel will have the radiological training designated above.</p> <p>2o. RC personnel will direct handling of all equipment in a manner that prevents against contamination to personnel or the environment. An RWP may be required.</p> <p>Sampling personnel will have the radiological training designated above.</p> <p>2p. Quality personnel constitute part of the HEG to prevent against loss of quality in relation to sampling activities.</p> <p>2q. Personnel shall pay attention to uneven terrain in working areas such as ground level piping to prevent slips, trips, and falls.</p>

Appendix C
Sample and Analysis Plan Table

Plan Table Number: ESP-011-05
 S&P Number: ICPEXT-05-00027
 Date: 07/18/2005 Plan Table Revision: 2 Project: ESP-011-06 TAN PHM-2A, V14 TANK POST-TREATMENT SAMPLING

Sampling and Analysis Plan Table for Chemical and Radiological Analysis

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Sampler: Haney, D. F.

SNO Contact: GRIGG, D. M.

Project Manager: HANEY, D. F.

Sample Description						Sample Location																								
Sampling Activity	Sample Type	Sample Matrix	Cell Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (m)	Enter Analysis Types (A1) and Quantity Requested																				
										A1	A12	A13	A14	A15	A16	A17	A18	A19	A10	A111	A12	A13	A14	A15	A16	A17	A18	A19	A10	A11
EN100001	REG	SOLID	COMP	COMP	9/20/05	ICDF	TANK V-14	GRID 3 R ANGLE	NA	1	1																			
EN100002	REG	SOLID	COMP	COMP	9/20/05	ICDF	TANK V-14	GRID 3 L ANGLE	NA	1	1																			
EN100003	REGOC	SOLID	COMP	COMP	9/20/05	ICDF	TANK V-14	GRID 13 R ANGL	NA	2	2																			
EN100004	REG	SOLID	COMP	COMP	9/20/05	ICDF	TANK V-14	GRID 13 L ANGL	NA	1	1																			
EN100005	REG	SOLID	COMP	COMP	9/20/05	ICDF	TANK V-14	GRID 23 R ANGL	NA	1	1																			
EN100006	REG	SOLID	COMP	COMP	9/20/05	ICDF	TANK V-14	GRID 23 L ANGL	NA	1	1																			
EN100007	REG	Liquid	GRAB	GRAB	9/20/05	ICDF	TANK V-14	GRID 3 R #1	NA	1	1																			
EN100008	REG	Liquid	GRAB	GRAB	9/20/05	ICDF	TANK V-14	GRID 23 L #2	NA	1	1																			
EN100009	REGOC	Liquid	GRAB	GRAB	9/20/05	ICDF	TANK V-14	GRID 13, #1	NA	2																				
EN100010	REG	Liquid	GRAB	GRAB	9/20/05	ICDF	TANK V-14	GRID 13, #2	NA	1																				
EN100011	REG	Liquid	GRAB	GRAB	9/20/05	ICDF	TANK V-14	GRID 23, #1	NA	1																				
EN100012	REG	Liquid	GRAB	GRAB	9/20/05	ICDF	TANK V-14	GRID 23, #2	NA	1																				
EN100013	REG	SOLID	COMP	COMP	9/15/05	ICDF	TANK V-14	GRID 3 R ANGLE	NA	1																				
EN100014	REG	SOLID	COMP	COMP	9/15/05	ICDF	TANK V-14	GRID 3 L ANGLE	NA	1																				
EN100015	REG	SOLID	COMP	COMP	9/15/05	ICDF	TANK V-14	GRID 13 R ANGL	NA	1																				

The sampling activity displayed on this table represents the first 6 to 9 characters of the sample identification number will appear on the sample labels.

A11: Moisture Content

A12: Particulate Liquids Test

A13: VOCs (1 AL)

A14:

A15:

A16:

A17:

A18:

A19:

A10:

Analysis Suites:

D - Double QC Volume T - Triple QC Volume

Comments:

P11 Test will be performed after tank contents are stabilized

Plan Table Number: ESP-011-05

SAP Number: ICPIEXT-CS-00827

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Sampling and Analysis Plan Table for Chemical and Radiological Analysis

Date: 07/16/2005 Plan Table Revision: 2 Project: ESP-011-05, TAN RM-2A, V-14 TANK POST-TREATMENT SAMPLING

Project Manager: HANEY, D. F.

SMO Contact: GRIGG, D. M.

Sampling Activity	Sample Description				Sample Location				Enter Analysis Types (AT) and Quantity Requested																					
	Sample Type	Sample Matrix	Cell Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20	
EL1105016	REG	SOLID	COMP	COMP	9/15/05	'C05'	TANK V-14	GRID 13, ANGL	NA																					
EL1105017	REG	SOLID	COMP	COMP	9/15/05	'C05'	TANK V-14	GRID 23, P. ANGL	NA																					
EL1105018	REG	SOLID	COMP	COMP	9/15/05	'C05'	TANK V-14	GRID 23, ANGL	NA																					
EL1105019	REG	Liquid	GRAB	GRAB	8/20/05	'C05'	TANK V-14	TEST SAMPLE	NA																					
EL1105020	REG	SOLID	COMP	COMP	8/20/05	'C05'	TANK V-14	TEST SAMPLE	NA																					